

دراسات عن الامونيم بيركلوريد
١- تأثير المستويات المختلفة لمركب الامونيم بيركلوريد على سرعة النمو والكفاءة
التحولية في الحملان

ج • عد الحافظ ، ف • الحصى ، ا • عامر ، ع • السباعى

أستخدم فى التجربة ٢٤ من الحملان النامية (عمرها ٦ أشهر) قسمت عشوائياً الى أربعة مجموعات ١ ، ٢ ، ٣ ، ٤ وأستخدمت المجموعة الاولى للمقارنة ثم أعطيت المجموعات الباقية مركب أمونيم بيركلوريد فى الغذاء بمعدل ٢٥ ، ٥٠ ، ١٠٠ ، ٢٥٠ ، ٥٠٠ ، ١٠٠٠ ملىجرام لكل كيلو جرام من وزن الجسم لكل من المجموعة ٢ ، ٣ ، ٤ على الترتيب ، فقد استمرت المعاملة لمدة ثلاثة شهور كما جرى تقدير ميزان الازوت على حيوانين من كل مجموعة •

ودراسة النتائج المتحصل عليها وجد أن اضافة الامونيم بيركلوريد بمعدل ٢٥ ملىجرام لكل كجم من وزن الجسم ، أدى الى زيادة سرعة النمو فى الحملان ، وكذلك زاد انتاج الصوف فى هذه المجموعة بمقدار ١٦٩٩% عن مجموعة المقارنة وقد كان الفرق بين المعاملات معنوى فى حالة النمو فقط • كما وجد أيضاً ان النيتروجين المهضم وكذلك النيتروجين المحتجز بالجسم قد زاد زيادة جوهرية باضافة ٢٥ ملىجرام من الامونيم بيركلوريد •

من هذا يتضح ان المستوى المناسب من الامونيم بيركلوريد للحملان النامية هو ٢٥ ملىجرام لكل كيلو جرام من وزن الجسم •

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EXPERIMENTAL STUDIES ON AMMONIUM PERCHLORATE
I. EFFECT OF VARIOUS LEVELS ON GROWTH RATE AND
EFFICIENCY OF FOOD UTILIZATION IN LAMBS.
(With 4 Tables)

By

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SUMMARY

Twenty four growing Saidi lambs (6 months age) were divided randomly into four groups to study the effect of level of ammonium perchlorate on growth rate and efficiency of food utilization. Supplementation of ammonium perchlorate were added at 0, 25, 50 and 100 mg/kg body weight for groups I, II, III & IV respectively. The treatments prolonged for 3 months. Body weight as well as wool production were studied. Besides, N-balances were carried out for two animals in each group.

It was detected that ammonium perchlorate supplementation at a level of 25 mg beneficially affected the growth rate of lambs. Also, at this level, wool production increased by 16.99% of the control. The difference between treatments were significant only in growth rate. Digested N and N retained increased significantly by adding 25 mg ammonium perchlorate. Ammonium perchlorate at 25 mg/kg body weight seemed to be the more suitable level of supplementation for growing lambs.

INTRODUCTION

Several factors are involved in affecting the growth of domestic animals of which the thyroid hormones play an important role in regulating the process of growth (BLAXTER REINEKER, CRAMPTON & PETERSON, 1949).

Many trials have been proposed with the aim of using, thyrostatic preparations in order to reduce the secretory level of the thyroid gland in an attempt to reduce the catabolic processes and consequently improves the gain in body weight (ICAIEV, 1970 and LAZAREV, 1970).

It has been stated by several investigators (RAGEB, 1972, SALON, YAKIMENKO & MICHAILOV, 1971, AMER, 1974 and TKA SHEK, 1974) that ammonium perchlorate as a cheap and safe thyrostatic can lower the functional activity of the thyroid gland and increase the production of meat, egg and wool.

The object of this study is to determine the level of ammonium perchlorate that would produce optimum performance in lambs through the estimation of growth and nitrogen balance.

MATERIALS AND METHODS

Twenty four growing saidi male lambs (6 months age and 22.0 kg body weight) were used in this study. Lambs were divided randomly into four groups (6 lambs each) according to body weight. Groups were designed as I, II, III & IV. Group I being the control, while II, III and IV were the experimental ones. The experiment was carried out in the Experimental farm, Faculty of Agriculture, Assiut University. The experiment was extended for three months.

Animals were kept tied in a semi-open shed and were individually fed. Water was available ad libitum.

All animals were fed at 1.5 X maintenance energy level. Wheat straw was fed at a rate of 100gm daily for each animal. The concentrate mixture consisted of 25% decorticated cotton seed meal, 30% extracted rice bran, 25% wheat bran, 17% corn,

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2% limestone and 1% commercial salt. Feeding allowance from concentrate mixture were adjusted, every two weeks to corresponding with changes in body weight gains.

Groups II, III and IV were fed ammonium perchlorate, at a level of 25 mg, 50 mg and 1000 mg/kg body weight respectively. During weighing the concentrate mixture, the amount of ammonium perchlorate required for each animal was weighed and well mixed with it.

All lambs were weighed at two weeks intervals from the beginning to the end of the experiment. Water and food were with-hold over night before weighing.

At the end of the experiment, wool sample from each animal was taken from the midside region (100 cm²) by fine scissors using a specially designed metal fork, 10 centimeters in width. The samples were used to determine clean wool production after scouring according to CHAPMAN (1960).

Nitrogen balances:

After a preliminary period of 2 months, nitrogen balances were carried out over a 7-day period for two animals in each group. A representative sample of food stuff was taken, bulked, grounded and preserved for analysis. Faeces was collected daily, mixed thoroughly and weighed. Portion, 10% of collected faeces, was taken for dry matter determinations. The dried daily faecal samples were pooled together, ground and kept in tightly closed containers for chemical analysis. The volume of voided urine was measured daily. Two ml of sulfuric acid (conc.) were added in the collecting bottle as preservative. Daily urine samples were later composited and a

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representative sample drawn and analysed for nitrogen content. Nitrogen content in feed, faeces and urine samples was estimated by kjeldahl method.

Obtained data were subjected to statistical analysis according to SNEDECOR (1962).

RESULTS AND DISCUSSION

Consumption and performance data for the growth study with lambs are shown in Table (1). These results show that the body weight gain was more faster in group II than the control (group 1). On the other hand, it could be detected that body weight gain decreased with increasing ammonium perchlorate level from 25 mg to 100 mg/kg body weight. The percentages of daily gain was 117.48%, 82.36% and 79.32% of the control for the second, third and fourth group respectively. The differences in body weight gain between the control and experimental groups were statistically significant at 5% level (Table 2).

The promotive effect of ammonium perchlorate on growth rate at a level of 25 mg/kg body weight is confirmed with the results of RAZOMOVSKI (1971) in calves and AMER (1974) in rams. Furthermore, the detected increases in body weight gain of the lambs received 25 mg/kg body weight ammonium perchlorate may be explained on the basis that this supplementation retarded the rate of passage of food through the gastro-intestinal tract which leads to a better digestion and absorption (RAGEB, 1972). Besides, it cause a decrease in the catabolic processes and consequently improves the body weight gain (AMER, 1974).

On the other hand, the decrease in body weight gain in groups received higher levels of ammonium perchlorate, over

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25 mg/kg body weight may be attributed to the fact that depression of thyroid function results in a concomitant of growth hormone production and reduce growth rate (HAFEZ, 1968).

Further studies were needed to explain the affect of higher levels of this supplementation on food intakes rate of passage of food through the gut, histological structure of the thyroid gland and the activity of the proteolytic, enzymes in the liver and muscles.

In the nitrogen balance studies, dealing with the absolute values, the daily nitrogen intake was almost the same in all groups (Tables 3, 4), yet groups II, III and IV retained 158.18%, 121.1% and 100.6% nitrogen of the control group respectively.

It could be noticed that digested N and N retained were improved significantly by supplying 25 mg ammonium perchlorate per Kg body weight (Table 3). However, the differences between the other groups were not significant. These variations may be attributed to differences in N metabolism as reflected from the significantly differences in urinary N of the different groups. The excreted N in group II is significantly lower than that of the control (group 1). These results compare favourably to those obtained by AMER (1974) ; that the hypofunction of the thyroid gland of rams received ammonium perchlorate (2 mg/kg body weight) retards rate of excretion of end products of protein metabolism by urine and faeces compared with control.

The present results have shown also that utilization of ration by growing lambs (Table 1) was affected significantly (P/0.05) by the presence of ammonium perchlorate in the diet. The maximum utilization was achieved where ammonium perchlorate was fed at a level of 25 mg/kg body weight.

In respect to wool production, the results revealed that clean wool yield of group II increased by 16.99% of group I. However, the other groups have the same yield (Table 1). The difference between groups were not significant. The increase in wool growth of group II, receiving 25 mg ammonium perchlorate, may be due to dosage of 25 mg makes thyroid function in optimum level for promoting wool growth.

Generally, it can be concluded the suitable level of supplementation is 25 mg ammonium perchlorate per Kg body weight for growing lambs under local conditions.

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Table (I) : Performance data for growing male lambs.

Item	Diets			
	Control	25 mg/kg B.W.	50 mg/kg B.W.	100 mg/kg B.W.
	I	II	III	IV
Initial body weight Kg	22.08± 2.28	22.17± 1.70	22.00± 0.89	22.08± 1.50
Final body weight Kg	29.00± 2.33	30.30± 1.98	27.70± 1.46	27.50± 1.30
Av. daily gain gm.	76.89± 3.17	90.33± 6.66	63.33± 8.54	60.22± 7.71
Av. daily S.V. intake gm.	424	±25.76 429	±20.85 419	±14.77 417
Efficiency of food utiliz.	5.51± 0.37	4.75± 0.36	6.62± 1.68	6.92± 1.17
Av. wool production gm / 100 cm ²	11.12- 0.60	13.01± 0.97	11.26± 1.17	11.18± 1.46

Table (2) : Analysis of variance of performance data for growing lambs.

S. O. V.	d.f.	Mean squares			
		In. B.W.	Fin. B.W.	Daily gain	Eff. of food utiliz. wool yield
Bet. treatments	3	0.016	33.1330*	1147.6200*	13.4421*
Error	20	16.698	9.7455	280.5487	3.8420
					7.2498

* Significant at 5% level.

In. B.W. = Initial body weight.

Fin. B.W. = Final body weight.

Table (3) : Nitrogen balance studies with growing lambs.

Item	Groups			
	I	II	III	IV
Intake daily :				
Feed " gm "	675.0	721.0	691.5	658.0
Nitrogen " gm "	24.807	26.396	25.378	24.221
N. digested daily :				
Nitrogen " gm "	18.229	20.486	13.608	17.557
% of intake	73.48	77.61	73.32	72.48
Urinary N. daily	8.860 c	5.666 a	7.261 abc	8.132 bc
N. retention daily				
Nitrogen " gm "	9.369 a	14.820 c	11.347 a	9.425 a
% of intake	37.77 a	56.14 c	44.71 b	38.91 a
% of digest	51.40 a	72.34 b	60.98 a	53.68 a

All the values are averages of two animals.

Different signs are significant at 5% level.

Table (4) : Analysis of variance of the effect of ammonium perchlorate level on N-digested and retained.

		Mean squares						
S. O. V.	d.f.	Nitrogen intake gm.	N. digested gm.	Digested % of intake	Urinary N. retained gm.	N. retained % of intake	N. retained % digested	
Bet. treatments	3	1.7174	3.1492 ^{##}	10.5450 ^{##}	3.7818 ^{##}	13.0533 ^{##}	141.16 ^{###}	177.13 ^{##}
Error	4	0.4638	0.2827	1.4470	0.4309	0.5688	4.42	12.62

^{##} Significant at 5 % level.
^{###} Significant at 1 % level.